

Claims

1. A method for the manufacture of paper, in particular of fine paper, in which method paper stock is fed from a headbox (100) to a wire section (200) in which
5 water is drained from a paper web (W), in which method the paper web (W) is passed from the wire section (200) to a press section (300) to press water out of the paper web (W), and in which method, after the press section (300), the paper web (W) is dried in a dryer section (400), precalendered and precoated in a precoater (600), after which the paper web (W) is dried in a drying section (650) and coated
10 in a coating station/stations (700,800), after which the paper web (W) is dried in a drying section/sections (750,850), calendered in a calender (900), and reeled in a reel-up (1000), characterized in that in the method
- the stock is fed into the headbox (100) from a short circulation the stock volume of which has been minimized,
 - 15 - in the wire section (200), water is drained from the paper web (W) in a former, most advantageously in a gap former (250),
 - in the press section (300), water is pressed out of the paper web (W) in at least one extended nip press (360),
 - in the dryer section (400), at least part of the drying of the paper web (W) is
20 carried out by means of impingement drying (450),
 - the paper web (W) is precalendered in a calender (900) employing low nip loads,
 - both surfaces of the paper web (W) are precoated at the same time,
 - after precoating (500), the paper web (W) is dried by means of contact-free
25 drying (660),
 - the paper web (W) is coated in an on-line coating station/stations (700, 800), after which the paper web (W) is at least partly dried in a drying section/sections (750,850) by means of contact-free drying of the paper web (W), and
 - 30 - the paper web (W) is calendered in an on-line calender (900) while the linear load in each nip is regulated separately.

2. A method according to claim 1, characterized in that, in the method, the basis weight profile is controlled by consistency adjustment in the headbox (100) in order to affect the fibre orientation of the paper web (W) by controlling the profile.
- 5 3. A method according to claim 1, characterized in that, in the method, a shoe press is used as the extended nip press (350,360).
4. A method according to claim 1, characterized in that two felts or a felt and a transfer belt are used in the press nips in the press section (300).
- 10 5. A method according to any one of the preceding claims, characterized in that, in the method, the amount of surface size / pigment used in precoating (600) is profiled.
- 15 6. A method according to any one of the preceding claims, characterized in that, in the method, combinations of impingement drying and cylinder drying or non-web-contacting drying and cylinder drying are applied to the drying of paper in order to accomplish a fast grade change.
- 20 7. A method according to any one of the preceding claims, characterized in that, in the method, in connection with the contact-free drying carried out after precoating (600) and coating (700,800), the drying of the paper web is profiled by means of a profiling device.
- 25 8. A method according to any one of the preceding claims, characterized in that, in the method, a coating device of the blade, jet or spray type is used in the coating (700,800).
- 30 9. A method according to any one of the preceding claims, characterized in that, in the method, the paper web (W) is measured by means of sensors fixed to a transverse beam in order to monitor properties of the paper web (W), and that, in

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the method, the profiling of the properties of the paper web (W) is controlled based on the measurement results.

5 10. A method according to any one of the preceding claims, characterized in that, in the method, the drying of the paper web in the dryer section (400) is profiled by using impingement drying.

10 11. A method according to any one of the preceding claims, characterized in that, in the method, a moistening device based on steam or water mist, placed before the calender (900), is used for profile control of curl.

15 12. A method according to any one of the preceding claims, characterized in that, in the method, precalendering against a cylinder or a roll is used in the dryer section.

13. A method according to any one of the preceding claims, characterized in that, in the method, the paper web (W) is supported by means of belts in the end part of the paper machine.

20 14. A method according to any one of the preceding claims, characterized in that, in the method, the principal drying in the after-drying units is carried out without contact with the web.

25 15. A method according to any one of the preceding claims, characterized in that, in the method, low linear loads, advantageously below 80 kN/m, are used in the precalender (500).

30 16. A method according to any one of the preceding claims, characterized in that, in the method, precalendering is carried out using an extended nip calender.

17. A method according to any one of the preceding claims, characterized in that, in the method, fine paper is manufactured using layering of fibres and/or additives and/or fillers.
- 5 18. A paper machine line in particular for the manufacture of fine paper, which line comprises a short circulation, a headbox (100), a wire section (200), a press section (300), a dryer section (400), a precaler (500), a precoater (600) and a drying section (650) after that, a coating station/stations (700, 800) and after-drying section/sections (750,850), a calender (900) and a reel-up (1000), characterized in
- 10 that the paper machine line comprises a short circulation the stock volume of which has been minimized, that the wire section (200) comprises a former (250), that the press section (300) comprises at least one extended nip press (360), that at least part of the dryer section (400) is based on impingement drying (450), that the precoater (600) of the paper web (W) is two-sided, and that the paper machine line further
- 15 comprises an on-line coating station/stations (700,800) and, placed after said station/stations, a drying section/sections (750,850) substantially based on contact-free drying, and that in the paper machine line there is an on-line calender (900) in which the linear loads in each nip can be regulated separately.
- 20 19. A paper machine line according to claim 18, characterized in that the on-line calender is a multi-nip calender.
20. A paper machine line according to claim 18 or 19, characterized in that the headbox (100) is a multi-layer headbox.
- 25 21. A paper machine line according to claim 18 to 20, characterized in that the wire section is a gap former.
22. A paper machine line according to any one of claims 18 to 21, characterized
- 30 in that a latter nip (360) of the press section is an extended nip press.

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23. A paper machine line according to any one of claims 18 to 22, characterized in that in the press nips of the press section there are two felts or a felt and a transfer belt.

- 5 24. A paper machine line according to any one of claims 18 to 23, characterized in that the coater (700,800) is a coating device of the blade, jet or spray type.

- 10 25. A paper machine line according to any one of claims 18 to 24, characterized in that its drying sections (400,600,750,850) comprise as a combination both cylinder drying and impingement drying or cylinder drying and non-web-contacting drying.



- 15 26. A paper machine line according to any one of claims 18 to 25, characterized in that the after-drying sections (600,750,850) have been so dimensioned that principal drying takes place without contact with the web.

- 20 27. A paper machine line according to any one of claims 18 to 26, characterized in that the paper machine line comprises a moistening device based on steam or water mist, placed before the calender, for profile control of curl.

28. A paper machine line according to any one of claims 18 to 27, characterized in that the drying section comprises a precalendering device placed against a cylinder or a roll.

- 25 29. A paper machine line according to any one of claims 18 to 28, characterized in that the end part of the paper machine comprises belt support of the paper web.

30. A paper machine line according to any one of claims 18 to 29, characterized in that the precalender of the paper machine line is a soft or extended nip calender.

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